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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE



Judging the Fair

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PSYCHIATRY

Pills Help Delinquents

► **DELINQUENT BOYS** in a training school when given medicine—either a tranquilizer or a sugar pill—for research behave better and are much less of a problem to the administration.

This was learned from a study of 53 committed boys aged from 10 to 15 years, reported to the American Psychiatric Association in Chicago by Drs. Peter A. Molling and Leon Eisenberg of the Johns Hopkins Hospital, Baltimore, and Arthur W. Lockner Jr., also of Johns Hopkins, and Robert J. Sauls, assistant superintendent of Boys' Village, Cheltenham, Md.

Twenty-six boys in cottage A were given a tranquilizer, perphenazine, or a placebo (sugar pill without medicinal content) but neither the boys nor the experimenters knew which boys got the tranquilizer. A comparison group of 27 boys in cottage B got no medication.

Results were somewhat surprising to the investigators. Boys on the tranquilizer behaved much better. But so did the boys on the sugar pills. This lasted as long as the medication was continued.

After it was stopped, the boys on placebo continued to show improved behavior. Those who had been taking the perphenazine showed a rebound in symptoms when the medication was stopped.

Meanwhile, the 27 boys in cottage B without any medication, fake or real, were consistent in their problem behavior.

Evidently the expectancy of relief through medication, by either the delinquents or the house parents or both, leads to improvement in behavior among the training school boys, the investigators concluded.

It would appear, they said, that the very undertaking of research in the training school has potentialities for social good regardless of what the experiments show.

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Hypnosis—Mental Illness

► **HYPNOSIS** by an unqualified person can actually help cause mental illness.

What is believed to be the first case in medical-legal history in which hypnosis was accepted as contributory, although not entirely responsible, for mental illness was reported to the American Psychiatric Association meeting in Chicago by Dr. Bernard Teitel of Long Beach, Calif.

The case was that of a 45-year-old woman whose back was injured while she was working as a restaurant helper. When medicine and bindings failed to help, she was referred to a neurologist. He recommended a course in hypnosis. She took a course of six hypnosis treatments. The therapist, although a professional person, was not a psychiatrist.

In this case there was unmistakable evidence of what psychiatrists call a schizoid personality—the kind of person who is withdrawn, seclusive, shut-in. The woman

showed marked emotional detachment and fearfulness.

For the next nine months, the woman moved from one rooming house to another in rapid succession. She was trying to escape from persons who were "controlling her mind, hypnotizing her and attempting to harm her."

After the nine months of running, she had to be put in a hospital for treatment.

Individuals with schizoid type of personality development have an above-average chance of becoming mentally ill after hypnosis, Dr. Teitel told the psychiatrists. He warned them against using hypnosis with this kind of patient.

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Long Unhappy Marriages

► **SOMETIMES** a marriage is so disturbing to both husband and wife and appears so unsatisfactory to all observers that it seems headed for an immediate crack-up and yet it will unaccountably endure for years.

Study of 12 such long-standing discordant marriages showed that the very painfulness of the life together served a psychological purpose for both husband and wife.

Pleasurable adult sexuality was not a part of the patients' lives, within the marriage or outside it, Drs. Marietta Houston and R. B. Forman, psychiatrists of the Menninger Foundation, Topeka, Kans., reported at the American Psychiatric Association meeting in Chicago.

To the husband, life with the wife seemed to repeat his relationship with the mother of his childhood. Any frustration roused in him hostility toward his wife

MEDICINE

Veins Aid in Heart Attack

► **DURING HEART ATTACKS**, tiny "watchdog" blood vessels in the stomach and intestinal walls automatically shut down to assure adequate blood supply to more vital brain and heart tissue. This emergency blood diversion frequently can result in gastrointestinal damage.

Doctors for many years have noted abdominal stress associated with heart disorders. Scarred intestines, ulcers and other signs of gastrointestinal disorders have been found at autopsy of persons who died of a heart attack.

There had been no satisfactory explanation of how a circulatory disturbance remote from the gastrointestinal tract could so damage the stomach and intestines. Now Drs. Eliot Corday, David W. Irving, Herbert Gold and Harold Bernstein of the University of California, Los Angeles, Medical School and Cedars of Lebanon Research Institute apparently have the answer.

Using special electromagnetic flow meters

with the same intensity that in childhood he blamed his mother for everything that went wrong.

As for the wives, the close attachment they had with their mothers in childhood continues much the same in adulthood either in fact or in fantasy.

The wives were frigid and the husbands periodically impotent. Each sought excessive gratification from the other, and non-fulfillment led to infantile, demanding attitudes, childish expressions of anger, and cruel, sadistic behavior.

Only when one of the couple withdrew somewhat from the intense relationship of the marriage was the equilibrium of the situation upset.

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Sex Ideas Are the Same

► **FREUD'S IDEAS** about sex are identical with those of the Catholic moral philosopher, St. Thomas Aquinas, Dr. Martin Hoffman, Syracuse, N. Y., psychoanalyst, told the meeting of the American Psychoanalytic Association in Chicago.

Their definitions of what is normal sexual behavior and what is abnormal or perverse are essentially the same and can be traced to Judean-Christian moral teaching, Dr. Hoffman said.

It is Freud's great genius as a clinician, he reported, that has served to somewhat obscure the fact that Freud did introduce some moral values into his scientific theorizing.

We now know, he said, that science is not able to tell us that one form of behavior is better or worse than another; this determination can only come from ethics. But when Freud formulated his now famous sexual theory in 1905, he did not take this distinction sufficiently into account, perhaps because it was so new.

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and computers, the investigators measured blood flow in the tract during abnormal racing heart rhythms and heart attacks. They found the small blood vessels in stomach and intestinal walls contracted when blood pressure dropped, shutting off the blood supply to these areas.

They concluded that this is a "watchdog" mechanism for the body's circulation. It assures that at least a meager blood supply is saved during the shock that follows heart attack and hemorrhage so that vital brain and heart tissue may be nourished. During the process, however, stomach and intestinal tissue is seriously damaged from lack of nourishing blood, they reported at the American College of Physicians meeting in Miami Beach, Fla.

Fortunately, humans have an excess of such tissue, the investigators pointed out. Thus they generally have enough left to carry on nutritional needs. Otherwise death would occur after such a shock state.

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PUBLIC HEALTH

Volunteers Safeguarded

Peace Corps volunteers to be sent to Tanganyika will have adequate health facilities for emergencies and are taught self-care, Faye Marley reports.

► THE FIRST 28 PEACE CORPS volunteers to be sent overseas to Tanganyika, East Africa, where tropical diseases are common need not be overly worried about their health.

Dr. Robert T. Scholes, a U.S. Public Health Service specialist in tropical medicine and hygiene assigned to the Peace Corps medical program, has just returned from a survey of health conditions and facilities in Tanganyika. He reported that local health programs appear adequate to take care of most emergencies.

Twenty surveyors, four civil engineers and four geologists are now being selected for the first assignment, to help build roads.

"The Peace Corps is aware of the health danger," Dr. Scholes told SCIENCE SERVICE, "and is doing everything possible to take care of the health of the volunteers."

During their 12-week preparation period the volunteers will get a full coverage of disease hazards and a good dose of self-care training, Dr. Scholes said. After reaching Tanganyika, they will get specific health orientation along with lessons in speaking Swahili.

The majority of those who go into the tropics cannot avoid intestinal disorders, Dr. Scholes said, and the volunteers must be especially careful about food contaminated with fecal-borne material. In spite of such precautions as boiling their drinking

water, they probably will get amebic dysentery or some of the bacillary forms of the disease.

The bismuth preparations in their first-aid kits will take care of simple dysentery and they can go into local hospitals for stubborn cases.

Dr. Scholes does not anticipate any real trouble with the dread disease, schistosomiasis, but snail-infested waters should be avoided. In the event that anyone is bitten by tsetse flies in the game areas, he should watch for fever that can be treated before sleeping sickness is a danger.

Volunteers will take two tablets of chloroquine each week to suppress malaria and they must always wear shoes to keep from getting hookworm. Infectious hepatitis is another danger of fecal-borne contamination. The all-male group also will be warned that venereal disease is common. Shots before they leave the U.S. will include one for typhoid and paratyphoid and other inoculations for typhus, smallpox, polio, diphtheria, plague, influenza, tuberculosis and yellow fever.

In case of serious illness that could not be cared for by district hospitals, Peace Corps volunteers could be evacuated to a modern hospital at Dar es Salaam.

Dr. Scholes said that district hospitals are small but equipped to care for emergency surgery. Standards of cleanliness are high in all the health facilities.

The Peace Corps volunteers will carry complete first aid material that can be replenished in the districts where they will be working. There are 700 grade A and grade B native dispensaries in addition to about 80 government and special hospitals and dispensaries and 25 health centers, the physician explained.

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SURGERY

Save Emotional Crippling

► IMMEDIATE PLANS for facial reconstruction by plastic surgeons can prevent cancer patients undergoing mutilating operations from becoming emotional cripples, the American Association of Plastic Surgeons meeting in New York was told.

Dr. Jacob J. Longacre of Christ Hospital, Cincinnati, Ohio, said that rebuilding the face could be started immediately or within a few months if the surgeon were confident the malignancy had been completely removed.

In 239 malignancies removed at Christ Hospital, Dr. Longacre said, the recurrence rate has been slightly more than six percent. Some patients have been followed as long as 15 years.

"These facts have given us the courage to undertake immediate reconstruction," he concluded. "As a result, the patient's social, emotional and economic well-being are not so profoundly disturbed."

To be sure that all the malignancy has been removed, the surgeon and pathologist work together even before the operation takes place. They map out the area to be cut away, or excised, and during the operation, the pathologist analyzes sections of every edge of removed tissue.

In one case, Dr. Longacre said, 46 different sections were studied before the surgeon's work was completed.

Facial reconstruction, he pointed out, involves extensive surgery and the use of tissues from other parts of the body. He described a 41-year-old farmer patient who had 18 operative procedures following cancer surgery that had removed his right cheek, right half of the nose, part of the right lip and left eyelid.

Flaps of tissue brought from the patient's

abdomen and chest were used to reconstruct the cheek and nose. This man had become an alcoholic following the mutilating surgery but since his face was reconstructed he has held a steady job and has not had a drink for seven years, Dr. Longacre said.



BURIAL FOUND AT MISSILE CENTER—A seven-room Pueblo Indian site was found at the White Sands Missile Range, N. M., by Larry Hammack, a spare-time archaeologist. The skeleton, estimated to be over 800 years old, is that of a middle-aged adult.

SCIENTIA INTERNATIONAL

NOVAS DEL MENSE IN INTERLINGUA

Agronomia.—Le population mundial de boves e bufalos domestic es circa un tertio del population mundial human. Illo ha crescite in le curso del passate octo annos per circa 100 milliones e sta nunc in le vicinitate de un milliardo capites. Iste datos se trova in un reporto del statunitense Departimento de Agricultura.

Astronautica.—Dr. B. Black-Schaffer del Universitate Cincinnati ha constatate que animales experimental accepta le stress de enorme accelerationes multo melio si illos es pacate in saccos plenat de liquido. Pro render un tal impaccamento possibile, le animales es "hypothermized," i.e., illos es artificialmente ponite in un stato de hibernation. Un importante resultado de iste experimentos esseva le constatatione que animales que es naturalmente hibernatores—hamsters, per exemplo—es multo melio capace a tolerar le stress del impaccamento hypothermic in liquido e del acceleration subsequente que animales que non es naturalmente hibernatores—rattos, per exemplo. Le problema que Dr. Black-Schaffer nunc desira solver es eliminar le differentia inter non-hibernatores e hibernatores natural sub le conditiones del mentionate experimentos, i.e. stimular in non-hibernatores le reactiones que protege le hibernatores. Si le problema es solvite e si le solution es tal que illo pote esser applicate a humanos, grande consequentias pote resultar pro le astronautica futur.

Ingenieria Biomedical.—Un nove curriculum de cursos academic, combinante ingenieria e scientias medical, esseva initiate cooperative mente per le tres Universitates Johns Hopkins, Pennsylvania, e Rochester. Le curriculum duce al grado de doctor. Su existentia da recognition al crescente importantia del rolo de ingenieria e technologia in le campo del scientias medical.

Ingenieria Petroleari.—Campos electric pote esser usate pro miscer liquidos in un apparatusa sin partes mobile. Pro miscer, per exemplo, dimethylformamida, anilina, o varie esteres o aldehydas con le un o le altere hydrocarburo (que es usualmente non miscibile), le duo liquidos es placiate in un receptaculo equipate de duo electrodos de maniera que un del liquidos bania un del electrodos e le altere le altere. Un forte corrente directe inter le electrodos resulta in cargas electric opposite in le particulas del un e del altere liquido. Le assi generate attraction inter illos occasiona lor intermixture. Le methodo es efficace e economic. Illo esseva disveloppate in le laboratorios del Compania American Oil.

Medicina.—Undas ultrasonic esseva usate a bon successo in le tractamento de un morbo chronic del aures que, usque nunc, requirava frequentemente un intervention chirurgic con le resultado de forte perditas in audition. Le morbo es cognoscite como syndrome de Meniere e include como symptomata tinnito e vertigine. Le therapia a undas ultrasonic esseva usate per Dr. F. Altmann del Universitate Columbia in 60 casos e es recommendate per ille in loco del operation chirurgic quancunque iste syndrome non responde a medication.

Meteorologia.—Circa cento fulmines batte le terra omne secunda. Isto es le conclusion de calculaciones statistic effectuate per Dr. R. C. Davis del statunitense Bureau de Standards.

Ornithologia.—In le stato de Hessia in Germania, le population de ciconias ha declinate in le curso del passate dece annos per 43 percento. In altere partes de Europa le situation es similmente triste. Le causa pare esser le accele-

rate drainage de paludes e mariscos. Tal drainage es requirite in le interesse de un plus efficace economia agricultural, sed illo etiam resulta in le elimination de multes del fontes de alimentation pro le ciconias (que vive primariamente de ranas e pisces e altere creaturas aquatic).

Physica.—Un alligato de niobium e stanno, disveloppate in le laboratorios del Compania Electric Bell, provide un magnete permanente cento vices plus forte que omne altere material usque nunc cognoscite. Recercas effectuate per medio de iste nove alligato esseva reportate per Dr. Ch. E. Roos del Universitate Vanderbilt e Dr. G. Kneip del Laboratorio National Oak Ridge. On crede que iste disveloppamento va promover le technologia del generation de energia thermonucleari que require "bottillas magnetic" proque le temperaturas que debe esser attingite excede le tolerantia de receptaculos material.

Physica Atomic.—Tres libras de cobalt-60 esseva transportate ab le Laboratorios National Oak Ridge in Tennessee ad le Bureau National de Standards in Washington. Le radiation de tres libras de cobalt-60 es equivalente a illo de 180 libras de radium. Le receptaculo usate in le transporto habeva un peso de cinque tonnas. In transito le cargo requireva un frigidation continue.

Physica Nucleari.—Le Autoritate de Energia Atomic del Regno Unite a Harwell, Grande Britannia, ha perfectionate un nove methodo pro solver le problema del dejectos radioactive que es, cognoscite, un multo indesirabile producto lateral in le generation de energia atomic. Le dejectos, in un solution de acido nitric, es miscite con silice e borace, e le resultante mixtura es processate ad in materia vitrose que contine 20 a 30 percento de dejecto in forma oxydate.

Psychiatria.—Il non es rar, secundo Dr. R. Kohl del Universitate Cornell, que le curation de un patiente mental qui es maritate coincide con le declaration de un morbo mental in le sposo o sposa. In le curso de dece annos, Dr. Kohl ha vidite 46 tal casos. Le successo permanente del psychotherapia de un patiente maritate depende frequentemente del reactiones del parte del partenari de maritaggio qui non se ha presentate al consultation. Le situation es difficile si ille reactiones es predominantemente un attitude de hostilitate conscie o inconscie.

Psychiatria.—Inter 900 consecutive patientes de minus que 17 annos de etate admittite al hospital mental Bellevue in New York, 106 habeva tentate committer suicidio. Le plus juvenile del 106 habeva solmente octo annos. Octanta-cinque esseva pueras, 21 pueros. Inter le adolescentes, le predominantia del sexo feminin esseva ancora plus marcate: 77 esseva pueras e solmente octo pueros. Inter le 21 patientes de minus que 12 annos in le gruppo total del essayos de suicidio, le distribution del sexos esseva reverte: 13 esseva pueros e octo pueras.

Statistica Demographic.—Le etate medie del fermeros in le Statos Unite cresce progressive mente. Illo nunc es 50,5 annos. Plus que 16 pro cento de omne le fermeros statunitensees ha passate le etate de 65 annos. In West-Virginia le etate medie del fermeros es 54,5 annos, in Alaska 46 annos. Iste duo statos representa le duo extremos del scala. In illos, 25 e 8,2 pro cento del fermeros, respectivamente, ha passate le etate de 65 annos.

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GENERAL SCIENCE

Reading Interlingua

YOU CAN READ Interlingua if you had no more than one semester of high school French or Spanish or Latin and flunked it. You can read and understand a great deal of it even if you have never had contact with any foreign language.

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Send this page to an acquaintance abroad and tell him that he can get additional information about Interlingua from Alexander Gode, SCIENCE SERVICE's Interlingua Division, 80 E. 11th St., New York 3, N. Y.

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GENERAL SCIENCE

Science Fair Winners

Entries in the 12th National Science Fair-International included 385 finalists from 200 local and regional fairs. The high caliber of the projects tied two top awards.

See Front Cover

► **SIX TOP WINNERS** in this year's National Science Fair-International, sponsored by SCIENCE SERVICE May 10-13 in Kansas City, Mo., include two ties for first place honors in the two major judging divisions for girls' exhibits.

Tied in the girls' biological sciences division were Victoria Sue Richards, 17, Terre Haute, Ind., and Karen Orton Hodges, 17, San Antonio, Texas.

Victoria studied the nutritional possibilities of the Osage orange fruit, or common "hedge ball." After proving it was non-toxic, she went on to process it for use as animal food, extract oil and alcohol from it, and even use it in recipes for cookies and bread.

Karen studied the ecology of shallow beach water on Mustang Island, Texas, stressing factors affecting the abundance of microorganisms.

In the boys' biological division, top award went to James Michael Hosford, 18, Atlanta, Ga., who extracted the molt-controlling hormone from crayfish, injected it in mice, and tested the urine from the mice to establish an increase in calcium concentration. His project suggests possible medical applications.

Judges in the girls' physical sciences division could not make a choice between

Mary Frances Anderson, 17, San Diego, Calif., and Joyce Lea Yucker, 17, Albuquerque, N. M., and awarded another first-place tie. An "abstract string" suggesting relationships between abstract algebra and studies of intuition, was Mary Frances' winning project. Joyce's exhibit dealt with extraction and isolation of L-cystine from the keratin of human hair.

Winner in the boys' physical sciences division was Richard G. Bruschi, Jr., 17, Munster, Ind., who constructed and demonstrated a device for testing characteristics of a rocket nozzle, using compressed air.

All of these winners will receive "Wish Awards" of \$125 of scientific equipment or books of their own choice.

Presentation of the awards followed a talk (to be featured in next SNL) given by Dr. Robert Jastrow, chief, theoretical division, Goddard Space Flight Center, National Aeronautics and Space Administration.

Second Awards and \$75 Wish Awards went to: Arvie Caughfield, 17, Harlingen H.S., Harlingen, Tex., "Studies on Cotton Root Rot"; Ava Leavell, 16, John Tyler H.S., Tyler, Tex., "Flux Lines and Solubility"; Robert W. Berner, 17, Flathead County H.S., Kalispell, Mont., "Nuclear Magnetic Resonance," also winner of U. S. Army 1st award; Christopher George Cherniak, 16, Melbourne H.S., Melbourne,



MARY FRANCES ANDERSON—A project on algebra and intuition.

Fla., "Development and Use of Tissue Culture of Functioning Single Neurons," also winner of AMA, U. S. Army, USAF and U. S. Navy first awards; Robert E. Fischer, 17, a three-time finalist, Forest Hills H.S., Forest Hills, N. Y., "Design, Construction and Use of a Modified Cassegrain Electronic Astronomical Spectrum Analyzer," also winner of USAF first award and OSA second award; David C. Hill, 16, a two-time finalist, Grand Blanc H.S., Grand Blanc, Mich., "New Titanium Polymers," also winner of ADA Certificate of Meritorious Achievement and \$50, ACS, and the U. S. Army first awards; Robert Himes, 17, Belmont H.S., Dayton, Ohio, "The Peripheral Jet Ground Effect Machine," also winner of U. S. Army and USAF first awards; Edward Charles Jones, 18, a 1961 Science Talent Search Winner, Wakefield H.S., Arlington, Va., "Convex Smooth Curves"; and Robert E. Strom, 14, a two-time finalist, Bronx H.S. of Science, New York, N. Y., "Symbolic Compiler for Arithmetic and Logical Programs," also winner of U. S. Army and USAF first awards.

Third Place Awards and \$50 Wishes went to: Nancy Ann Free, 17, Immaculata H.S., Washington, D.C., "Triangular Proof of the Law of Probability"; Margaret Valeria Green, 16, Enka H.S., Enka, N.C., "Taxonomy of *Cladonia cristatella* (Lichens)"; Sandra Hager, 17, Milwaukee Lutheran H.S., Milwaukee, Wis., "Cancer Chemotherapy"; Astrid Imke Hausch, 17, Lower Moreland H.S., Huntingdon Valley, Pa., "Retention of a Maze Habit in Planaria After Sectioning"; John Franklin Alexander, Jr., 18, Leon H.S., Tallahassee, Fla., "Videotronic—An Electronic Aid for the Blind"; Gary N. A. Botting, 17, a two-time finalist, Adam Scott Collegiate and Vocational Institute, Peterborough, Ontario, Canada, "Intergeneric Hybridization Among Giant Silk Moths," also winner of NPCA first award; Charles K. Jablecki, 17, East Providence Senior H.S., East Providence, R.I., "Curvature of Droplets"; Karl Le-



KAREN ORTON HODGES—Studied the ecology of shallow beach water.



JAMES MICHAEL HOSFORD—Injected crayfish hormone into mice.

Grande Magleby, 18, Highland H.S., Salt Lake City, Utah, "Applied Research in Model Aeronautics"; Keith Goley Morgan, 18, Idaho Falls Senior H.S., Idaho Falls, Idaho, "Phonetic Digit Recognizer," also winner of U.S. Army first award; John H. Pickett, 17, Tantasqua Regional H.S., Sturbridge, Mass., "Spectrographic Analysis of Electron Excitation in Chlorophyll A"; Wayne Lee Settle, 18, a three-time finalist, Portland-Wayne Twp. Senior H.S., Portland, Ind., "Mutations Produced by the Irradiation of German Millet Seeds"; Baylor B. Triplett, 18, Highland H.S., Albuquerque, N.M., "Solid Rocket Propellants," also winner of U.S. Army, USAF and NASA first awards; Kenneth Linn Weaver, 15, Greeley H.S., Greeley, Colo., "Carnotite Radiation on Reproduction and Mortality Rates of *Daphnia magna*," also winner of U.S. Navy first award; Charles Theodore Womack III, 17, Greenwood H.S., Greenwood, Miss., "The Effects of Splenic Extracts on Sarcoma in Two Animal Species," also winner of AVMA and Path.-Med. Tech. first awards; and David Laster Zalkind, 16, Wakefield H.S., Arlington, Va., "A Study of Prime Numbers."

Fourth Place Awards and \$25 Wishes went to:

ALABAMA—Omer L. Burnett Jr., 17, Sylacauga H.S., Sylacauga; James S. McAleer, 17, McGill Institute, Mobile.

ARKANSAS—Jon G. Wilkes, 17, Hall H.S., Little Rock.

CALIFORNIA—Steven W. Agee, 18, Mt. Whitney H.S., Visalia; Erwin D. Fitch, 18, Holy Cross H.S., Santa Cruz; Judith Jaime, 16, Pacific H.S., San Bernardino; John L. Koethe, 15, Hoover H.S., San Diego; Steven

David Rosen, 17, Menlo-Atherton H.S., Atherton.

CANADA—Patrick T. McCool, 15, St. Columba's School, Pembroke, Ontario.

COLORADO—Steve W. Ballentine, 17, Abbey School, Canon City; Robert K. Colwell, 17, George Washington H.S., Denver. CONNECTICUT—Francis P. Pandolfi, 18, Kingswood School, West Hartford.

DELAWARE—Margaret E. Cairns, 17, Alexis I. duPont H.S., Wilmington.

FLORIDA—Judith L. Coy, 18, Boca Ciega H.S., Gulfport; Joseph Palatinus Jr., 17, Hillsborough H.S., Tampa.

FRANCE—Julia E. Tiede, 16, Paris American H.S., Paris.

GEORGIA—Mary Ann Asbell, 17, Glynn Academy, Brunswick.

IDAHO—Jesse W. Abbott, 18, Meridian H.S., Meridian; Beth Anne Burt, 16, Boise H.S., Boise.

ILLINOIS—Richard H. Axelrod, 17, James H. Bowen H.S., Chicago.

INDIANA—Mike F. Gorski, 17, T. C. Howe H.S., Indianapolis.

IOWA—Fred C. Damm, 17, Linn-Mar H.S., Marion; William C. Leighty, 17, West H.S., Waterloo.

JAPAN—Mizue Mori, 18, Marugama H.S., Kagawa-Ken.

KANSAS—Linda Dotson, 17, Rosedale H.S., Kansas City; Barbara Ann Winden, 18, Monsignor Luckey H.S., Manhattan.

MARYLAND—Richard L. Falwell, 16, Walter Johnson H.S., Rockville; Thomas R. Shepler, 17, Towson H.S., Towson; Stewart R. Wood, 16, Bladensburg H.S., Bladensburg.

MASSACHUSETTS—Joseph F. Litwin Jr., 18, Masconomet Regional H.S., Boxford; Keith R. Plossel, 16, West Springfield

H.S., West Springfield; Donald O. Whittemore, 17, Wachusett Regional H.S., Holden.

MICHIGAN—Charles M. Howey Jr., 17, Central H.S., Bay City; Barbara E. Parker, 17, St. Cyril H.S., Detroit.

MISSOURI—Michael L. Johnson, 17, Lebanon H.S., Lebanon; Ramsey A. Lammers III, 18, St. Charles H.S., St. Charles.

NEW JERSEY—Joseph F. Karnicky, 17, Notre Dame H.S., Trenton; James L. Maskasky, 18, Long Branch H.S., Long Branch.

NEW MEXICO—Douglas J. Elder, 19, Sandia H.S., Albuquerque; Rosemary T. Smith, 18, Carlsbad H.S., Carlsbad.

NEW YORK—Deborah Chase, 15, Bronx H.S. of Science, New York; Larry R. Presser, 16, Stuyvesant H.S., New York; Melodie M. Williams, 17, Chateaugay Central School, Chateaugay.

NORTH DAKOTA—Allen A. Redmann, 18, Walsh Co. Agricultural School, Park River.

OHIO—Rita C. Manak, 16, Lourdes Academy, Cleveland.

OKLAHOMA—Betty Ann Broding, 17, Thomas A. Edison H.S., Tulsa; Michael A. Phillips, 17, East Central H.S., Tulsa; Garrett Whitney, 15, College H.S., Bartlesville.

PENNSYLVANIA—Allen I. Burstiner, 17, Cedar Cliff H.S., Camp Hill; Gregory F. Fiore, 17, Lackawanna Trail Joint H.S., Factoryville; Walter L. Miller, 17, Nazareth Area H.S., Nazareth; Jay Sarajian, 17, Lower Moreland H.S., Huntingdon Valley; Ann E. Stuart, 17, Camp Hill H.S., Camp Hill.

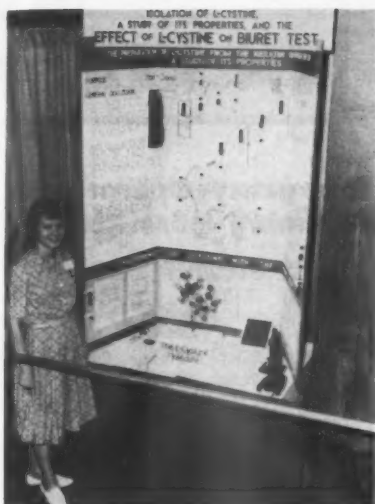
RHODE ISLAND—Kathleen M. McCarten, 15, St. Xavier Academy, Providence.

TENNESSEE—James R. Bishop, 16, Adamsville H.S., Adamsville; David C. Evans Jr., 17, White Station H.S., Memphis; Brenda W. Lisle, 17, Red Bank H.S., Chattanooga.

TEXAS—Mary E. Cornail, 16, Robert E. Lee H.S., Baytown; William R. Eason, 17, Longview H.S., Longview; James R. Hargrave Jr., 18, Wichita Falls H.S., Wichita Falls; Jack B. Hunnicutt, 18, R. L. Paschal H.S., Fort Worth; Kenneth R. Short Jr., 18, Permian H.S., Odessa.



VICTORIA SUE RICHARDS—Worked with the Osage orange fruit.



JOYCE LEA YUCKER—Studied extraction of *L-cystine* from human hair.

THAILAND—Vanida Sensathien, 17, Suksanari School, Thonburi.

VIRGINIA—David D. Elsea, 18, Handley H.S., Winchester; Edward W. Lusby Jr., 17, James Madison H.S., Vienna.

WASHINGTON—David B. Goodson, 18, Auburn H.S., Auburn; R. David Guthrie, 18, Mt. Rainier H.S., Des Moines; Leslie M. King, 17, Everett H.S., Everett.

WEST VIRGINIA—Thomas H. Brooks, 18, Buffalo H.S., Kenova; Seth Sharr, 16, Sistersville H.S., Sistersville.

Special Awards

The American Chemical Society presented First Awards of plaques and \$100 for purchase of materials to further winners' study and experimentation to David C. Hill, 16, Grand Blanc H.S., Grand Blanc, Mich., "New Titanium Polymers" and to Joyce Lea Yucker, 17, Highland H.S., Albuquerque, N. M., "L-Cystine Preparation and Properties." Alternate Awards of inscribed plaques were given to Ava Leavell, 16, John Tyler H.S., Tyler, Tex., "Flux Lines and Solubility," and to George David Mendenhall, 16, Milan H.S., Milan, Mich., "An Azide Rearrangement." Suitably inscribed certificates recognized each winner's sponsoring teacher and the winners were given subscriptions to the *Journal of Chemical Education*.

The American Heart Association presented a medallion and all-expense-paid trip to its annual meeting in Miami Beach, Florida, Oct. 20-23, 1961, to Thomas Michael Bryan, 16, South Williamsport Area Jr.-Sr. H.S., South Williamsport, Pa., for his project, "Hypothermia."

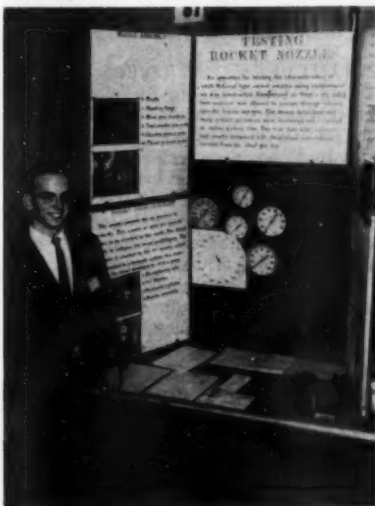
The American Institute of Biological Sciences presented its awards of all-expense paid trips to participate in and exhibit at its annual meeting, August 26-30, 1961, Purdue University, Lafayette, Ind., to Robert K. Colwell, 17, George Washington H.S., Denver, Colo., "Albino Maize in

Photosynthetic Experimentation," and to Joyce Marie Howell, 17, Stewartville H.S., Goodview, Va., "Inherited Tail Lengths of Manx Cats." Honorable Mention Awards went to Gary N. A. Botting, 17, Adam Scott Collegiate and Vocational Institute, Peterborough, Ontario, Canada, "Intergeneric Hybridization Among Giant Silk Moths," and to Kenneth Linn Weaver, 15, Greeley H.S., Greeley, Colo., for his exhibit, "Carnotite Radiation on Reproduction and Mortality Rates of *Daphnia magna*."

The Optical Society of America gave two awards. A first award of \$125 to be used for the purchase of materials, equipment, books, etc., for the furtherance of the finalist's interest in the broad field of optics, went to Donald Karl Wiest, Jr., 15, University H.S., Laramie, Wyo., for his work on "Color Changes in Gemstones Induced by Radiation and Heat." The second award of \$75, to be used for the same purposes as specified above, went to Robert E. Fischer, 17, Forest Hills H.S., Forest Hills, N. Y., for "Design, Construction and Use of a Modified Cassegrain Electronic Astronomical Spectrum Analyzer."

The Pathologist-Medical Technologist first award of a certificate and a summer job with the American Registry of Pathology at the Armed Forces Institute of Pathology in Washington, D. C., plus up to \$300 travel expenses, went to Charles Theodore Womack III, 17, Greenwood H.S., Greenwood, Miss., for his exhibit on the "Effects of Splenic Extracts on Sarcoma in Two Animal Species." The second award, a citation, went to Deborah Chase, 15, Bronx H.S. of Science, New York, N. Y., for "Inquiry into Bacteriophage Stimulation of *Escherichia coli*."

The Society of American Bacteriologists presented their first award of an engraved plaque, certificate of merit, and \$125 to further the winner's career in science, to Deborah Chase, 15, Bronx H.S. of Science, New York, N. Y. for her "Inquiry into



RICHARD G. BRUSCH, JR.—Constructed a device for testing rocket nozzles.

Bacteriophage Stimulation of *Escherichia coli*." The second award of an engraved plaque, certificate of merit, and \$75 was presented to two finalists who tied for this honor—Ann Elizabeth Stuart, 17, Camp Hill H.S., Camp Hill, Pa., "Development of Lysozyme-Resistant Mutant, *Bacillus megaterium*" and Walter C. Vinson, 17, DeWitt Clinton H.S., New York, N. Y., for "Overcoming the Homograft Reaction in Mice by Producing an Immunological Tolerance to a Homiotransplant Embryonically." Honorable mention went to Judith Louise Coy, 18, Boca Ciega H.S., Gulfport, Fla., for her exhibit "Can Plant Antibodies Replace Human Antibodies in the Production of Rh Typing Serum?"; David Blaine Goodson, 18, Auburn Senior H.S., Auburn, Wash., for "DNA Mechanisms in Viral Infections"; and Kathryn Aleene Kampe, 16, Albert G. Parrish H.S., Selma, Ala., with "Transduction in Bacteria."

The National Pest Control Association presented a first award of a certificate plus \$100 to be used for the purchase of materials to further the winner's study and experimentation in the broad general area of biology to Gary N. A. Botting, 17, Adam Scott Collegiate and Vocational Institute, Peterborough, Ontario, Canada, for his work, "Intergeneric Hybridization Among Giant Silk Moths."

Armed Forces, NASA Awards

National Science Fair projects especially relevant to science in the U. S. Navy, Army, Air Force and the National Aeronautics and Space Administration were honored at the awards banquet.

Rear Admiral Victor Hicks made National Navy Science Cruiser awards to: Christopher George Cherniak, 16, Melbourne H.S., Melbourne, Fla., "Development and Use of Tissue Culture of Functioning Single Neurons"; Edward L. DeLoach, 17, San Angelo Central H.S., San Angelo, Tex., "Parasitism in the Life Cycle of the *Stagmomantis carolina*"; Frederick Lewis Harris, 15, University H.S., Laramie, Wyo., "The Mystery of Mutations"; Gary J. Hartman, 17, Abbey School, Canon City, Colo., "Regeneration of Bone Marrow Under Severe Stress"; David F. Reichert, 17, Stephen F. Austin H.S., Austin, Tex., "Identification of a Monosomic Chromosome in Cotton"; John David Rigdon, 17, Chaffee H.S., Chaffee, Mo., "3 R's for Rats"; Elliott D. Ross, 16, Curtis H.S., Staten Island, N. Y., "Can Algae Be Used as an Efficient Means of Producing Oxygen and Food Nutrients in Space Travel?"; Edwin Frederic Schultz III, 16, Benjamin Franklin Senior H.S., New Orleans, La., "Fuel Cells: The Power Plant of the Future"; Mark L. Shaw, 16, T. C. Howe H.S., Indianapolis, Ind., "Visual Perception in Rats"; Kenneth Linn Weaver, 15, Greeley H.S., Greeley, Colo., "Carnotite Radiation on Reproduction and Mortality Rates of *Daphnia magna*."

Precision binoculars and invitations for Navy Science Cruises next summer were awarded to these finalists.

Dr. Paul A. Siple, chairman of the
(continued on p. 333)

MEDICINE

Hormone Gives Hope For Anemic Children

► **SUCCESSFUL USE** of the male hormone testosterone in combination with corticosteroids gives hope for children with aplastic anemia, a usually fatal disease.

A defect of the bone marrow, where red blood cells are formed, is responsible for aplastic anemia. Reports of treatment of 17 children with acquired aplastic anemia show regeneration of bone marrow in 13 patients.

Drs. Nasrollah T. Shahidi and Louis K. Diamond of Harvard Medical School and the Children's Hospital Medical Center, Boston, report the daily oral dosage of testosterone was one or two milligrams per kilogram of body weight. This was combined with a daily dosage of corticosteroids ranging from eight to 20 milligrams, they report in the *New England Journal of Medicine*, 264:953, 1961.

Similar treatment given to seven patients with inherited aplastic anemia resulted in improvement of six, but these patients were dependent on continued treatment.

In successfully treated patients with the acquired form of the disease, the physicians said remission continued for three to 22 months after withdrawal of medication.

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MEDICINE

Family Doctors Needed On Medical Faculties

► **TO OVERCOME** the shortage in family doctors, more "specialists" in general practice should be asked to join the faculties of medical schools.

Dr. Thomas E. Rardin of Ohio State University College of Medicine, Columbus, says in the lead article of the *Journal of the American Medical Association*, 176:479, 1961, that he will be "challenged" for suggesting that family practice is a specialty.

However, Dr. Rardin says there is good argument supporting the thesis that a family doctor can be "expert" and deserving of the designation "specialist" if he has been trained for and develops skill in "relating his wide general perspective of comprehensive medicine to a single person or a family group over a continuing period of time."

Dr. Rardin is vice chairman of the American Medical Association's section on general practice.

Physicians also read in the official magazine:

There is an increased number of deaths in operating and delivery rooms because of risks in administration of anesthetics. Inexperienced personnel and inadequate equipment add to the danger of death for both mother and child.—Dr. James Henry Ferguson, University of Miami School of Medicine, Miami, Fla. (p. 483).

Use of Sabin oral live poliovirus vaccine in Czechoslovakia "gives real hope for the complete eradication of poliomyelitis" in

that country. For the first time in 30 years not a single case of paralytic polio was confirmed following 1960 vaccinations. Before the 1961 summer season, it is planned to vaccinate children born after last year's immunization program and to revaccinate children vaccinated in 1960.—Drs. Vilem Skovranek, Ministry of Health, and Karel Zacek, Institute for Sera and Vaccines, Prague, Czechoslovakia (p. 524).

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GEOLOGY

"Soft" Rock Layer Deep Within Earth Predicted

► **A SOFT** rock layer is probably lying underneath the dense continents and oceans deep within the earth.

The layer was found when sound waves traveling through the earth slowed down temporarily when they passed through the upper part of the earth's mantle, a thick shell surrounding the core. The existence of the low-velocity layer shatters the previously held idea that the velocity of sound waves increases with depth after they reach the earth's mantle.

At these depths may be the well or reservoir of molten rock that reaches the surface of the earth and spews out of volcanoes, Dr. Frank Press, director of the California Institute of Technology Seismological Laboratory, Pasadena, suggests in *Science*, 133:1455, 1961. The low velocity through this region could indicate that the rocks are near the melting point, Dr. Press states.

Very high temperatures at depths approaching 100 miles outstripped the influence of tremendous pressures from overlying rock to form the "softer" layer, the scientist believes.

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TECHNOLOGY

Round Trip to the Moon For \$600 Possible

► **FUTURE VACATIONERS** could be taking a round trip to the moon for the bargain price of \$600.

This low price, which does not include tips, could become a reality if a single stage nuclear rocket was used for the trip, M. W. Hunter of Douglas Aircraft Company, Inc., reports. The \$600 figure does include the cost of pilot, stewardesses, food and other direct operating factors.

The success of the venture hinges on making the space craft reusable, as conventional aircraft now are. Multi-stage rockets would skyrocket the costs to an impractical figure, Mr. Hunter states.

About 200 tons of payload a year would be needed to keep a 20-man expedition continuously supplied on the moon, Mr. Hunter reports in the *SAE Journal*, publication of the Society of Automotive Engineers, 69:85, 1961.

The \$600 price tag is actually much less than the present average cost for a vacation trip to Europe.

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IN SCIENCE

SURGERY

Emergency Operations Becoming More Rare

► **HEART STOPPAGE**, massive hemorrhage and obstructed breathing are the only operations left on the "absolute emergency" list, Dr. Marc Iselin, chief surgeon, Hospital of Nantes, Paris, France, said at the meeting of the North American Federation of the International College of Surgeons in New York.

Preparation before the operation actually yields better results than the emergency type, the French surgeon said. The use of antibiotics, blood restoration and transfusions, with the administration of various chemicals plus drugs to reduce stress reaction have made much emergency surgery unnecessary. Local wounds also should be prepared—even patients with severely wounded limbs are best treated in advance of operation.

Such treatment is of great use when there are large numbers of injured patients requiring care, Dr. Iselin pointed out.

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ASTRONOMY

Red Star Gas Moves At Trillion Tons a Second

► **RED GIANT STARS**, the largest stars known, continuously send as much as a trillion tons of gases into space each second, an astronomer has discovered.

Dr. Armin J. Deutsch of Mt. Wilson and Palomar Observatories, Pasadena, Calif., first found these stellar gases spewing from the "cool" red giant Alpha Herculis, which is about 186,000,000 miles in diameter, compared to the sun's 864,000 miles.

Spectroscopic observations showed that stellar winds, containing the gas from the red giant, are blowing about a hundred billion miles away from the star, past a small companion star that travels around it. The "cooler" or the larger a red giant star is, the more gas escapes per second.

Gas also streams away from the sun but at a lesser rate than in the red giants. The sun is, like all yellow stars, smaller but hotter-burning than a red giant star.

Dr. Deutsch said the winds that blow from the red giants probably supply the main portion of interstellar gas, which is constantly being used up as new stars form. Astronomers have estimated that half of the material in a new star came from other stars.

The red giants are often called "dying stars," since they gradually shrivel up as they release their matter into interstellar winds. Red stars are believed to end up as white dwarf stars, the last stage of stellar evolution.

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THE FIELDS

MEDICINE

Electrocardiograph Reveals Heart Condition

► **STRESS TESTS** to reveal heart conditions have been modernized through a new radio-electrocardiograph system originally used for astronauts, the American College of Cardiology learned at its meeting in New York.

The instrument, called the RKG 100, consists of a pocket-sized transmitter that broadcasts a patient's heart beats to a receiver as far as 500 feet away. The receiver relays the information to an oscilloscope, electrocardiogram recording machine or tape recorder for the physician's interpretation.

Dr. Samuel Bellet, chief of the division of cardiology, Philadelphia General Hospital, reported 58% abnormal responses among 147 patients with high blood pressure or hardening of the arteries. The abnormality was noted only or chiefly during exercise.

Stress tests such as these offer a clue to the reason patients have heart attacks shortly after a standard electrocardiogram has shown normal functioning.

Telemedics, Inc., a subsidiary of the Vector Manufacturing Co., Inc., Southampton, Pa., developed the RKG 100.

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GEOLOGY

Ocean Bottom Layer Formed in Miocene Era

► **THE MYSTERIOUS** second layer that lies beneath the soft ocean bottom probably formed about 30,000,000 years ago during the Miocene era.

The layer formed when molten lava spewing up from the earth's interior spread a thick carpet of basaltic rock on the ocean floor, Dr. Harry S. Ladd, member of the Project Mohole, reported. Mohole scientists recently reached the layer for the first time while test drilling near Guadalupe Island off the western coast of Mexico.

Project Mohole is an attempt to drill through the earth's outer crust to the underlying mantle.

The softer layers overlaying the basalt in the test area have definitely been identified as of Miocene age, but scientists cannot pinpoint the age of the basalt until more drilling is done, the U. S. Geological Survey scientist said.

One of the biggest handicaps facing Mohole scientists is to find a drill that can quickly penetrate through the dense basaltic layer. A new turbodrill, designed by French engineers, was tried out during the test drilling over the ocean waters and was very successful, Willard Bascom, the project's technical director, said. The drill rotates 750 times a minute, compared to

the customary slow drilling rate of 40 rpm.

The drill was also tested on land in California when the drilling ship returned from its sea drilling and the results were excellent, Mr. Bascom said.

Plans are now being drawn up for the design of a new ship and more preliminary drilling before the final assault of penetrating through the earth's crust to the underlying mantle is attempted. Mohole scientists hope to make the final attempt in two or three years.

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ASTRONOMY

Twinkling Stars Caused By Entire Atmosphere

► **TWINKLING OF STARS** in the night sky is probably due to air swirling throughout the entire atmosphere and not in just a few layers, as many scientists believe.

Circulating air masses cause changes in temperature that bend or distort the star's light rays as they penetrate the earth's atmosphere, Dr. S. H. Reiger of the Rand Corporation, Santa Monica, Calif., told the joint meeting of the Institute of Radio Engineers and the U.S. National Committee of the International Scientific Radio Union in Washington, D. C.

Dr. Reiger believes the entire atmosphere must be in a turbulent state to account for the high temperature fluctuations measured by air-borne instruments. Many scientists have thought stars twinkle because of relatively thin but highly active layers of air about three to eight miles above the earth's surface. However, temperature changes within these "seeing layers" much be much greater than those actually measured if this were true, Dr. Reiger stated.

The observed twinkling agreed quite well with the calculated results, the scientist reported.

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ASTRONAUTICS

Balloon Reduces Speed of Space Capsule Re-entry

► **A HUGE BALLOON** that inflates in a fraction of a second could be used to slow down manned space capsules re-entering the earth's atmosphere.

Nose cones or manned space capsules hurtling toward earth at three times the speed of sound, or about 2,000 miles per hour, would quickly slow down due to the balloon's drag, F. R. Nebiker of Goodyear Aircraft Corporation, Akron, Ohio, reported in the SAE Journal, 69:97, 1961, publication of the Society of Automotive Engineers. The balloon, which is packed in the space vehicle, is automatically inflated and sent swirling into the atmosphere when the vehicle approaches the earth.

The balloon can be used with a Mercury capsule such as that which brought the first U.S. astronaut, Alan B. Shepard, safely back to earth. Reverse rockets and parachutes were the braking forces in that shot.

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PHYSIOLOGY

Protein Type Hormone Causes Weight Loss

► **TWO HEALTHY** male medical students lost weight on a free choice menu of meat, vegetables, potatoes, bread, fruit, ice cream, sandwiches, eggs and cereal. But they ate less because they were taking doses of a protein type hormone called glucagon.

Drs. Sydnor Barksdale Penick and Lawrence E. Hinkle Jr., with the assistance of E. Grace Paulsen, all of the New York Hospital-Cornell Medical Center, New York, report in the New England Journal of Medicine, 264:893, 1961, that it is possible that "glucagon and insulin, which oppose each other in the regulation of the blood glucose, also oppose one another in the regulation of food intake."

The only side effect noted in these two students was some glycosuria (sugar in the urine).

Glucagon has been studied mainly for its effect on carbohydrate metabolism.

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ENTOMOLOGY

Queen Bee's Saliva Keeps Hive in Order

► **THE QUEEN HONEYBEE** rules the hive and keeps the worker bees attentive with, of all things, saliva.

Some strange chemical in the queen's mouth juices makes her attractive to the workers. Because of it, they constantly surround her, groom her body and feed her, and life in the hive is orderly.

This chemical, as yet unidentified, comes from the queen's mandibular glands, the large salivary glands beneath the lower jaw, Dr. Norman E. Gary of Cornell University, Ithaca, N. Y., reports.

When these glands are removed, the queen's power over her subjects is destroyed almost completely. About 85% of her attractiveness is lost, Dr. Gary said. Her attendants wander away and she may die of neglect.

Apparently the queen's attractiveness to the workers is not related to her egg-laying ability, for workers swarm to mated and virgin queens, or even dead ones, with equal loyalty, so long as their mandibular glands are intact and the attractant chemical is detectable. Very young virgin queens, however, do not secrete as much of the chemical as do older ones, and they attract fewer attendants.

The newly found chemical, Dr. Gary reported in Science, 133:1479, 1961, is one, or perhaps more than one, that the workers can smell. It is more than a lure for grooming and feeding the queen. It is the key to the entire hive activity, for it brings the attendants into bodily contact with the queen, from whom they gather other chemicals, known as pheromones. These substances, passed from one bee to another by mouth, dictate the behavior and physiological responses of every bee in the community.

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ASTRONOMY

Arcturus Shines in Southern Sky

Several bright stars can be seen on June evenings. Most prominent is Arcturus in the constellation Bootes. Others are Spica, Deneb, Vega and Capella, James Stokley reports.

➤ LOOK TOWARD the south on a clear evening in June, and you will see several bright stars—bright enough to be ranked by the astronomer as "first magnitude." Perhaps the most prominent is Arcturus, in the constellation of Bootes, the herdsman, which is high in the south.

The accompanying maps show its position, along with other stars of the evening, as it appears about 10 p.m., your own kind of standard time at the first of June. By the middle of the month they will be similarly located about an hour earlier. (Add one hour for daylight saving time.)

Just below Bootes you will see Virgo, the virgin. This is one of the 12 constellations of the zodiac, the belt through which the sun, moon and planets seem to move. The brightest star in Virgo is Spica.

To the right of this group stands another zodiacal constellation, Leo the lion. Denebola, which is indicated on the map, is supposed to mark the animal's tail; it is second magnitude. Farther down, toward the west, is Regulus. This is actually a first magnitude star, but is dimmed on account of its low altitude. It marks the end of the handle of the sickle, a group of six stars shaped like that agricultural implement.

The blade of the sickle is shown on the northern sky map. Close to it is Mars, the only planet shown. This is now quite faint, mainly because of its distance. On June 20 it will be just twice as far as the sun—about 186,000,000 miles away.

Libra Seen in the South

Low in the south you can see Libra, the scales. These stars, none very bright, are arranged in the form of a somewhat distorted pentagon. And just to the left Scorpius, the scorpion, is partly visible, with the first magnitude star Antares. It is noticeably ruddy in color.

Above Scorpius is the large constellation of Ophiuchus the serpent-bearer, along with Serpens, the serpent that he is supposed to be carrying. And in the east, just to the left, you find Aquila, the eagle. In it is the star Altair, also somewhat dimmed because it is so near the horizon.

A little farther to the left and you come to Cygnus the swan, with Deneb as the brightest star. (This is shown on the map of the northern sky.) Above this group is Lyra, the lyre, with Vega, which is similar in brightness to Arcturus. Above it is Hercules, another well-known group, although it has no stars of the first magnitude.

High in the northwest is Ursa Major, the great bear, of which the familiar "great dipper" is part. And in this, in turn, are the two stars—Dubhe and Merak—known as the "pointers." A line through them, ex-

tended toward the east, brings you to Polaris, the pole star which stands almost directly over the north pole of the earth. It is at the end of the handle of the little dipper, which is part of Ursa Minor, the lesser bear.

Although Mars is the only planet shown on our maps, three others are visible later in the night. Before midnight at the first of June, and two hours earlier at the end of the month, brilliant Jupiter appears in the southeast. It is preceded by Saturn, about a twelfth as bright, but still ranking as first magnitude. And Venus, about 5.25 times as bright as Jupiter, appears low in the east about an hour before the sun rises.

Although Sirius, the dog-star, which shines so brilliantly on winter evenings and is the most brilliant star we can see at night, is gone from view, two very bright stars are visible in June. These are Vega and Arcturus. In the list of bright stars, the sun, of course, is first and then comes Sirius. Next are Canopus and Alpha Centauri, which are so far south that they cannot be seen from most parts of the United States.

These are followed by Arcturus, Vega and Capella. The latter shines high overhead on winter evenings, in Auriga, the charioteer. It is still visible, just above the

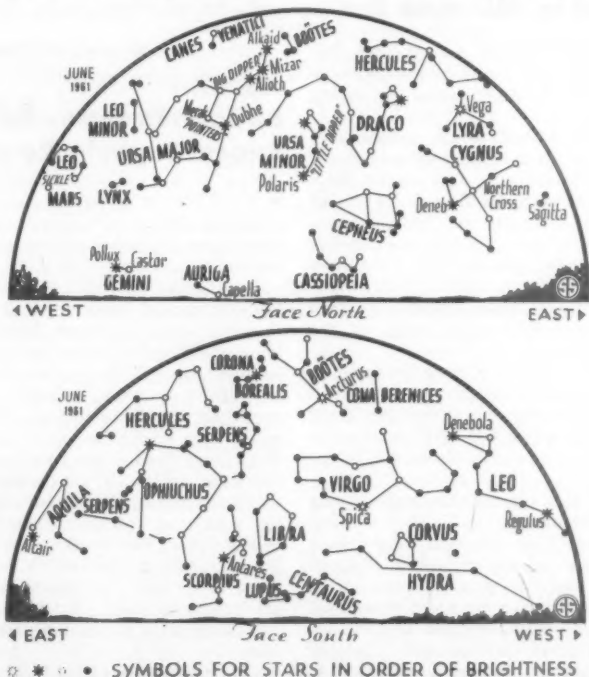
northern horizon where its normal brilliance is greatly dimmed by the great amount of air through which its light has to travel.

Actually, Arcturus, Vega and Capella are so nearly alike in brightness that some find one and some another to be the brightest of the three. The fact that they are of different color makes them difficult to compare. Vega is bluish, Capella yellowish, and Arcturus has a ruddy tinge. However, one recent and authoritative listing puts Arcturus first and Vega second.

This, of course, refers to their apparent brightnesses, which depend both on their actual brightnesses or candlepowers and their distances. The same law that determines the relative brilliance of two lights at different distances on earth applies equally in the sky. If two stars are of equal brightness and one is twice as far as the other, the more distant will appear a quarter as bright as the nearer one. Or, if the distant one is four times as bright as the other, they will appear the same.

Arcturus Brighter Than Vega

Arcturus is so distant that its light (which travels 186,000 miles per second) takes 36 years to reach us; we say that its distance is 36 light years. Vega is 26.5 light years away, so evidently it is not as bright intrinsically as Arcturus, which is 100 times as bright as the sun. Vega is equal to 50 suns. But Capella is still farther, 47 light years, and exceeds the sun's brightness 130 times. Now look below Vega at Deneb, in



☉ * • • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

Cygnus the swan. As they appear in the sky, Vega is about 3.3 times as bright as Deneb, yet Deneb's distance is 1,500 light years or about 56.6 times as far. This means that it must actually be exceedingly brilliant, in order to shine so brightly across such a gap. And so it is. Deneb is about 50,000 times as luminous as the sun.

Another distinction of Arcturus is its rapid motion across the sky—rapid, that is, compared with other stars. While the planets change their positions from year to year—even from week to week—the stars seem to stay in the same place. A hundred years ago—a thousand years ago—the stars were arranged about as they are now. The constellations looked to William the Conqueror in 1066 about the same as they do to us. But the stars are moving across the sky. Fifty thousand years ago the seven stars that now form the great dipper were arranged very differently; and 50,000 years in the future they will have a still different arrangement.

It was in 1718 that the English astronomer Edmond Halley (of comet fame) announced that Sirius, Arcturus and some other stars were in a little different position in the sky from where they had been charted in ancient times. Among the stars bright enough to be conspicuous in our skies, none that is visible from these latitudes changes its direction as rapidly as Arcturus. But even this is slow compared to a human lifetime. It will take more than 700 years for its direction to change as much as the apparent diameter of the full moon.

Celestial Time Table for June

June	EST	
1	10:00 p.m.	Moon nearest, distance 227,000 miles
2	1:00 p.m.	Moon passes Saturn
3	1:00 a.m.	Moon passes Jupiter
4	4:19 p.m.	Moon in last quarter
5	4:00 a.m.	Moon passes Venus
13	12:17 a.m.	New moon
17	5:00 p.m.	Moon farthest, distance 251,800 miles
18	5:00 a.m.	Moon passes Mars
19	9:00 p.m.	Venus farthest west of sun
21	4:02 a.m.	Moon in first quarter
	10:30 a.m.	Sun farthest north; summer commences in Northern Hemisphere
28	7:38 a.m.	Full moon
29	7:00 p.m.	Moon passes Saturn
	8:00 p.m.	Moon nearest; distance 224,000 miles
30	7:00 a.m.	Moon passes Jupiter

Subtract one hour for CST, two hours for MST, and three hours for PST

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Questions

ASTRONOMY—What is believed the source of half the material of new stars? p. 328.

PUBLIC HEALTH—How long is the preparation period for Peace Corps volunteers? p. 323.

Photographs: Cover, pp. 325, 326 and 327, Science Service; p. 323, R. C. Homman; p. 336, Trim'n Comb Co.

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Books of the Week

For the editorial information of our readers, books received for review are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C.

ADVANCED CALCULUS: An Introduction to Analysis—Watson Fulks—Wiley, 521 p., \$11.25. Text is divided into three main sections: calculus of one variable, vector calculus and theory of convergence.

AMERICAN BUILDING ART: The Twentieth Century—C. W. Condit—Oxford, 427 p., illus., \$15.00. Continues author's earlier volume on American building techniques and structural forms, discussing steel truss, suspension and concrete bridges, concrete dams and the metropolitan parkway.

CAREERS IN MATHEMATICS—George A. W. Boehm, Ed., foreword by J. Barkley Rosser and

Phillip S. Jones—Nat. Council of Teachers of Mathematics, 28 p., illus., paper, 25¢. Short biographies of eight young mathematicians and general description of careers in mathematics.

CITIZENS BAND RADIO—Allan Lytel—Rider, J. F., 152 p., illus., paper, \$3.90. Written for the user and the technician who repairs CB equipment.

CONFERENCE ON PHYSIOLOGICAL ASPECTS OF WATER QUALITY, 1960: Proceedings—Harry A. Faber and Lena J. Bryson, Eds.—PHS, 244 p., illus., paper, free upon request direct to Research & Training Grants Branch, Div. of Water Supply and Pollution Control, Public Health Service, Washington 25, D. C.

DECADE OF EXPERIMENT: The Fund for the Advancement of Education, 1951-61—Fund for the Advancement of Education, 110 p., illus., paper, free upon request direct to publisher, 477 Madison Ave., New York 22, N. Y. A review of the projects in education supported by the Fund.

THE DESIGN OF SMALL DIRECT-CURRENT MOTORS—A. F. Puchstein—Wiley, 407 p., \$12. Compendium of methods for solving the problems involved in the calculation and design of direct-current machines.

DYNAMICS OF EVEN-AGED FOREST STANDS—M. S. Czarnowski—La. State Univ. Press, 132 p., \$5. Explains in a comprehensive way the theory and practice of this branch of forest ecology.

ELEMENTARY HUMAN PHYSIOLOGY: A Text For Undergraduates—Terence A. Rogers—Wiley, 417 p., illus., \$6.50. Course also suitable for students not majoring in medical science.

ELEMENTS OF MATHEMATICAL STATISTICS—Howard W. Alexander—Wiley, 367 p., \$7.95. Intended as an introduction to probability and mathematical statistics for students who completed a year of calculus.

EVALUATION IN MATHEMATICS: Twenty-Sixth Yearbook—Miriam Goldman, Ed., introd. by Donovan A. Johnson—Nat. Council of Teachers of Mathematics, 215 p., \$3. Written to help teachers of mathematics—elementary, secondary and junior college—to improve their techniques of evaluating achievement.

FUNCTIONAL ANATOMY: Mammalian and Comparative—W. James Leach—McGraw, 3rd ed., 338 p., illus., \$6.50. This revised and enlarged edition of the author's *Functional Anatomy of the Mammal* contains considerable amount of comparative material concerning the lower vertebrate forms.

FUNDAMENTALS OF MODERN PHYSICS—Robert Martin Eisberg—Wiley, 729 p., illus., \$10.50. Advanced undergraduate course in physics introducing student to quantum mechanics, presupposing training in elementary physics and in mathematics through intermediate calculus.

THE FUTURE OF MANKIND—Karl Jaspers, transl. from German by E. B. Ashton—Univ. of Chicago Press, 342 p., \$5.95. Psychiatrist-philosopher, German Peace Prize winner in 1958, examines the present world situation as faced by contemporary thinking man.

A GUIDE TO EARTH HISTORY (Original Title: The Story of Our Earth)—Richard Carrington—New Am. Lib., 284 p., illus. by Maurice Wilson, paper, 75¢. History of the planet, evolution of life on earth and early man.

HISTORY OF THE EARTH: An Introduction to Historical Geology—Bernhard Kummel—Freeman, 610 p., illus., \$8.75. Introductory textbook designed to give student background for nearly any course of lectures in historical geology.

HOW TO KNOW THE AMERICAN MARINE SHELLS—R. Tucker Abbott—New Am. Lib., 222 p., illus., 12 p., color photographs, paper, 75¢. An authoritative guide to shells of the Atlantic and Pacific coasts.

HOW TO LOCATE AND ELIMINATE RADIO AND TV INTERFERENCE—Fred D. Rowe—Rider, J. F., 2nd rev. ed., 160 p., illus., paper, \$2.90. Includes discussion of the latest FCC rules and regulations.

INDIA—Walter A. Fairseris, Jr.—World Pub., 127 p., illus. by Richard M. Powers, \$3.50. Anthropologist's introduction to India, for young people.

INFRARED ABSORPTION IN INORGANIC SUBSTANCES—Katheryn E. Lawson—Reinhold, 200 p., \$6.75. Sourcebook of currently available information on this new and increasingly important phase of spectroscopy.

• Science News Letter 79:332 May 27, 1961

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Patents of the Week

A method for shaping metals by explosions has been patented. A warning system for trucks traveling over the safe speed limit has been invented.

► **EXPLOSIONS CAN BE USED** to shape large pieces of metal, a new patent holds.

Shock waves generated by the explosion shape hard-to-form metals and metal alloys placed in a die, inventor Donald W. Cole of Weatherford, Texas, stated in patent No. 2,983,242, assigned to General Dynamics Corporation, San Diego, Calif.

The die and metal are sunk in a liquid, rubbery solid or a powder. Dynamite is packed into a plastic ball and exploded, sending shock waves slamming into the metal and die.

Because the metal is formed in a split second, all air trapped between the metal and die is removed before the explosive is set off to prevent a rough surface from forming. The invention can replace the huge, expensive hydraulic presses and drop hammers now generally used, the patent stated.

A warning system for large trucks and other heavy vehicles that travel over the safe speed limit while going downhill won patent No. 2,983,911 for James O. Brafford of Pontiac, Mich., assigned to General Motors Corporation. A warning light shows up on the instrument panel when the engine reaches a speed controlled by a governor.

Nighttime driving can be safer by using a patented paint to mark divided highways and lanes for which James F. Wynn of

Marietta, Ohio, received patent No. 2,983,202, assigned to American-Marietta Company. Greater visibility, durability and resistance to skidding are claimed by the inventor. The paint contains rough-surfaced quartz grains that reflect light from a motorist's headlights. The grains do not dislodge easily when cars run over the lines, reducing the tendency to skid that is supposedly found in conventional highway paints.

For persons with a green thumb, Patterson D. Merrill of South Bend, Ind., has invented a compact unit (patent No. 2,983,076) for growing plants and flowers without soil. Nutritious liquid is pumped periodically into a gravel-packed plastic container containing seedlings or plants. The liquid then drains back into a false-bottom where it is stored for reuse.

A new type of surgical mask that permits normal unimpaired breathing, yet traps the bacteria in a person's breath, received patent No. 2,983,271. William C. Beck of Sayre, Pa., assigned the rights to The Frances Beck Memorial Fund, Waverly, N. Y.

A series of slats or shutters across the opening of the surgical mask are claimed to stop the bacteria-containing particles given off when the doctor or nurse exhales.

• Science News Letter 79:333 May 27, 1961

National Science Fair

(continued from p. 327)

judges, presented the U. S. Army and the Association of the United States Army Science Awards. Trips to Medical Service, Walter Reed Army Institute of Research, Washington, D. C. were awarded to: David Blaine Goodson, 18, Auburn Senior H.S., Auburn, Wash., for "DNA Mechanisms in Viral Infections"; and Jon Gardner Wilkes, 17, Hall H.S., Little Rock, Ark., for "Chemical Modification of Radiation Effects."

Trips to Ordnance Corps, Aberdeen, Md. were awarded to John E. Pearson, 17, Brookings H.S., Brookings, S. Dak., for "The Hyperbolic Paraboloïd—An Amazing Surface"; Will F. Rogers, 17, Jonesboro-Hodge H.S., Jonesboro, La., for "Wind Tunnel"; Robert E. Strom, 14, Bronx H.S. of Science, New York, N. Y., for "Symbolic Compiler for Arithmetic and Logical Programs"; and Baylor B. Triplett, 18, Highland H.S., Albuquerque, N. M., for "Solid Rocket Propellants."

A trip to the Army Chemical Center at Edgewood, Md. was awarded to Christopher George Cherniak, 16, Melbourne H.S., Melbourne, Fla., for "Development and Use of Tissue Culture of Functioning Single Neurons"; and to the Army Chemical Center at Fort Detrick, Md., the trip went

to Kathryn Aleene Kampe, 16, Albert G. Parrish H.S., Selma, Ala., for "Transduction in Bacteria."

Trips to the Army Quartermaster Research and Engineering Command, Natick, Mass. were awarded to David C. Hill, 16, Grand Blanc H.S., Grand Blanc, Mich., for "New Titanium Polymers"; and to Ann Elizabeth Stuart, 17, Camp Hill H.S., Camp Hill, Pa., for "Development of Lysozyme-Resistant Mutant, *Bacillus megaterium*."

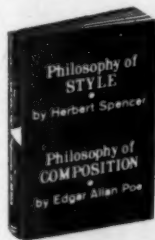
Trips to Army Signal Corps, Fort Monmouth, N. J., went to Keith Goley Morgan, 18, Idaho Falls Senior H.S., Idaho Falls, Idaho, for "Phonetic Digit Recognizer"; and to Rosemary Therese Smith, 18, Carlsbad H.S., Carlsbad, N.M., for "A Study of the Solar Cell."

Trips to the Army Corps of Engineers, Fort Belvoir, Va., went to Robert W. Berner, 17, Flathead County H.S., Kalispell, Mont., for "Nuclear Magnetic Resonance"; and to Joseph F. Litwin, Jr., 18, Masconomet Regional H.S., Boxford, Mass., for "Mechanical-Optical Seismograph."

Trips to the Army Transportation Corps, Fort Eustis, Va., were awarded to Robert Himes, 17, Belmont H.S., Dayton, Ohio for "The Peripheral Jet Ground Effect Machine"; and to Richard Lee, 18, Williston, Senior H.S., Williston, N.D. for "The

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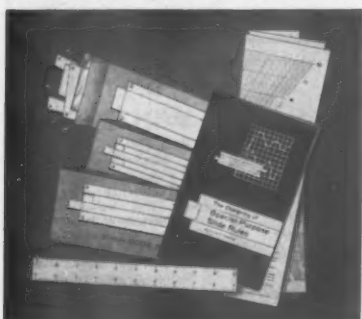
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ing summer vacation at one of the above
named research facilities.

Brigadier General Aullman Culbertson
presented the U.S. Air Force and Space
Education Foundation Certificates of
Achievement and 15-volume sets of Com-
pton's Pictorial Encyclopedia to nine final-
ists. Each award carries with it expenses-
paid trips of two to five days at an Air
Force Research and Development facility
in each of the following categories:

1. Aerospace Power—William Robert
Eason, 17, Longview Senior H.S., Long-
view, Tex., for "Project Halo—High Altitude
Launching Objective."

2. Aerospace Dynamics—Robert Himes,
17, Belmont H.S., Dayton, Ohio, for "The
Peripheral Jet Ground Effect Machine."

3. Aerospace Propulsion—James S.
McAleer, 17, McGill Institute, Mobile, Ala.,
for "The Plasma Jet."

4. Electronics—Jay Sarajian, 17, Lower
Moreland H.S., Huntingdon Valley, Pa.,
for "New Design in Microwave Techniques
Used in Electron Acceleration."

5. Electronic Computers—Robert E. Strom,
14, Bronx H.S. of Science, New York, N. Y.,
for "Symbolic Compiler for Arithmetic and
Logical Programs."

6. Atmospheric Physics—Mike F. Gorski,
17, T. C. Howe H.S., Indianapolis, Ind.,
for "Sea's in the Sky."

7. Aerospace Bioscience—Christopher
George Cherniak, 16, Melbourne H.S., Mel-
bourne, Fla., "Development and Use of
Tissue Culture of Functioning Single
Neurons."

8. Photography and Optics—Robert E.
Fischer, 17, Forest Hills H.S., Forest Hills,
N. Y. for "Design, Construction and Use of
a Modified Cassegrain Electronic Astro-
nomical Spectrum Analyzer."

9. Materials Research—Baylor B. Trip-
lett, 18, Highland H.S., Albuquerque, N. M.,
for "Solid Rocket Propellants."

The National Aeronautics and Space
Administration presented twelve awards—
six certificates of merit, plus expenses-paid
trips for two full days, for six finalist
winners to an NASA facility, and six
teacher recognitions—each winner to name
a teacher who will accompany the finalist
on the trip.

Two winners were selected in each of
the following categories:

1. Space Science—Mike F. Gorski, 17,
T. C. Howe H.S., Indianapolis, Ind., for
"Sea's in the Sky," and Kenneth Roy Short,
Jr., 18, Permian H.S., Odessa, Tex., for
"My Work in Astronomy."

2. Rockets—Douglas Joe Elder, 19,
Sandia H.S., Albuquerque, N. M. for "De-
velopment of a Subsonic Single Return
Wind Tunnel for Rocket Aerodynamics,"
and Baylor B. Triplett, 18, Highland H.S.,
Albuquerque, N. M., for "Solid Rocket
Propellants."

3. Manned Space Flight—Gary F. Barton,
16, Roosevelt H.S., Des Moines, Iowa, for
"Design Testing of Re-Entry Vehicles from
Space in a Two-Dimensional Supersonic
Wind Tunnel," and Elliott D. Ross, 16,
Curtis H.S., Staten Island, N. Y. for "Can
Algae Be Used as an Efficient Means of

Producing Oxygen and Food Nutrients in Space Travel?"

Second Health Awards

The Second American Pharmaceutical Association Award, a plaque, was given to William A. Burslem, Jr., 17, also an NSF-11 finalist, Northwestern Senior H. S., Hyattsville, Md., for "Combined Chemotherapy and Immunology in Cancer Control." (For First Awards winners, see SNL 79:308, May 20, 1961.)

American Medical Association Honorable Mention citations and plaques were given to Lynne Marie Alescot, 15, Saint Dominic Academy, Jersey City, N. J., for "Radioactive Isotopes as Tracers" and to Gary J. Hartman, 17, Abbey School, Canon City, Colo., for "Regeneration of Bone Marrow Under Severe Stress."

American Dental Association Certificates of Meritorious Achievement and \$50 for scientific equipment were presented to Joan Karen Palmer, 18, John Carroll H.S., Birmingham, Ala., for "Nutritional Value of Various Carbohydrates in White Rats" and to David C. Hill, 16, also a finalist at the 11th NSF-I, Grand Blanc H.S., Grand Blanc, Mich., for "New Titanium Polymers."

An American Veterinary Medical Association Honorable Mention citation plaque was given to Sandra Hager, 17, Milwaukee Lutheran H.S., Milwaukee, Wis., for "Cancer Chemotherapy."

• Science News Letter, 79:325 May 27, 1961

President's Greetings

► "The young scientists and their teachers represented at the Twelfth National Science Fair-International deserve high tribute. Behind this occasion stretch long hours of counsel and guidance by dedicated teachers to whom I send greetings on behalf of a grateful nation. In recognizing and encouraging the ability of the girls and boys here today, you play a significant role in developing the human resources which insure the future strength of our nation through science and technology.

"I extend my best wishes to the Science Clubs of America for the success of its Science Fair."

John F. Kennedy

• Science News Letter 79:335 May 27, 1961

ASTRONOMY

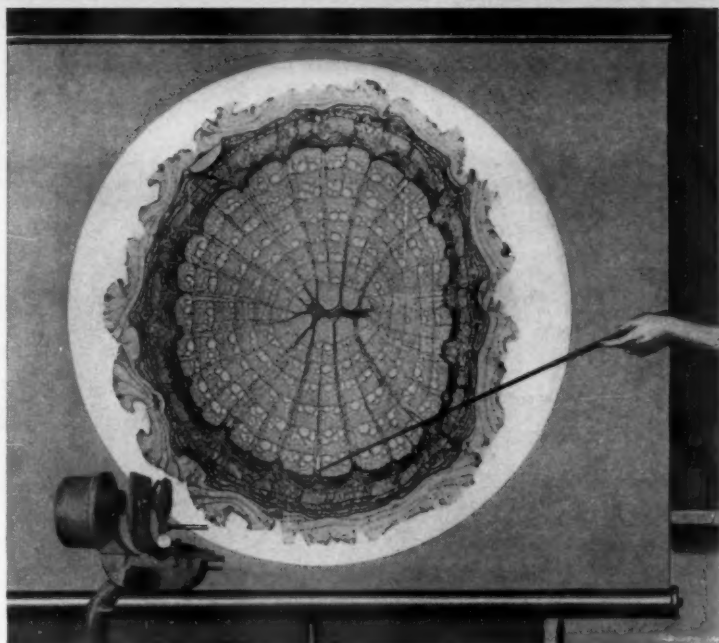
New Nova Spotted In the Southern Sky

► A NEW NOVA, a star that suddenly explodes into brightness equal to thousands of suns, has been discovered.

Novae increase their light and energy output only for a short while after which they dim down again. About 25 novae are reported each year but astronomers estimate that several hundred occur.

The nova Aprimashvili was discovered at a Siberian observatory on April 20 but is so faint it can only be viewed with a large telescope. The nova was of 14th magnitude when spotted in the constellation Ophiuchus in the southern sky, it was reported to Harvard College Observatory.

• Science News Letter, 79:335 May 17, 1961



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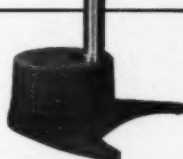


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☛ **SAFETY CAP** for prescription bottles keeps small children from accidentally swallowing harmful pills or liquid. The plastic cap is screwed on in the usual way, but in order to unscrew the cap, the person must press down while turning, which is something most children under six are unable to do.

• Science News Letter 79:336 May 27, 1961

☛ **DUSTING FABRIC** is a non-woven, pink lace-like material in which fibers and dust-absorbing chemicals are combined to pick up and hold dust. Lint-free and scratch-free, the disposable fabric contains no oils and will leave no surface film. Fabric comes on 12-inch wide roll, perforated at 18-inch lengths in 12 sections, and can be reused.

• Science News Letter 79:336 May 27, 1961

☛ **COFFEE DECANTER** of extra strong rippled glass with stainless steel pour spout is ideal for electric ranges, warmers and automatic brewing machines. Glass bowl is reinforced by attractive stainless steel band that protects against breakage. Detachable plastic handle is screwed to decanter neck and band.

• Science News Letter 79:336 May 27, 1961

☛ **COMB WITH RAZOR BLADE** attachment for home haircuts trims and shapes



hair as it combs and also may be used to shave neck or limbs. The comb, shown in the photograph, is made of plastic with a razor grip, tooth-edged plate at its center.

• Science News Letter 79:336 May 27, 1961

☛ **SPEAKER SYSTEM** politely tells person summoning an automatic elevator by pressing a button that the elevator will be arriving shortly. System is similar to that

which automatically calls out floor numbers and makes other announcements by speakers inside the elevator car and at landings.

• Science News Letter 79:336 May 27, 1961

☛ **CHAIR SEAT** of high density polyethylene is virtually indestructible and will withstand all family activities. It is impervious to freezing temperatures, boiling water, mildew, corrosion or bacteria. Mounted on a tubular steel frame in chrome plate or bronzite finish, the seat is suitable for dens, kitchens or family rooms.

• Science News Letter 79:336 May 27, 1961

☛ **PROBABILITY KIT** for teachers, students and others who enjoy determining the odds or chances of repetition. Kit contains a working scale model roulette wheel, a slot machine, chuck-a-luck, and cardboard parts for assembling giant dice. Instruction booklet includes experiments and history of laws and games of chance.

• Science News Letter 79:336 May 27, 1961

☛ **MARBLE SEALER** forms a seal within the marble rock pores of new and old marble surfaces. It will not discolor with age and lasts one year. Although ideal for both exterior and interior marble, the protective sealer can also be used on terrazzo, slate, granite and other stones.

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Nature Ramblings



Do You Know?

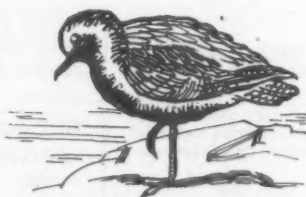
► **THE MIGRATION ROUTE** of the Arctic tern, a long loop from western Greenland and Canada through western Africa down as far as Antarctica and back up through South America, covers a distance of nearly 25,000 miles, still the longest yearly trip made by any bird.

But new evidence uncovered by Roger Tory Peterson, one of the most widely known bird experts since Audubon, indicates that the golden plover, long considered the second-place migrant, will be dropped all the way down to fourth place by two sandpipers.

During a bird watching trip to Patagonia, in Chile and Argentina, this past winter, Dr. Peterson saw three lone golden plovers near Camerones, 450 miles south of the area generally recognized as the southern limit for this species.

"On the other hand," Dr. Peterson wrote in Audubon Magazine, "two sandpipers, Baird's and the white-rump, which share the golden plover's summer range, reach the Beagle Channel and the southernmost islands of Argentine Tierra del Fuego,

Deposed Plover



1,100 miles south of the plover's pampas or 10,000 miles from their arctic home."

Although the two sandpipers are found together in winter and summer, they split up during migration. The white-rump, like the golden plover, takes the sea route, "hopping" from maritime Canada to the West Indies and South America." Baird's sandpiper, which Dr. Peterson found "on every pebbly stream in the high Andes between 14,000 and 16,000 feet," may travel over the "treeless backbone" of both North and South America.

—GLORIA BALL

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The TIROS II weather satellite had snapped 11,102 photographs through its wide-angle lens when scientists remotely shut off the camera.

Polyoma virus, a recently discovered mouse virus, is capable of causing a variety of tumors when inoculated into newborn mice or hamsters.

The main function of paint for aerospace application is to provide proper solar radiation reflection and heat emissive characteristics to maintain the temperature of the satellite within specified limits.

Hens that eat grass or have a lot of corn in their diet will produce deep-colored yolks whether they lay white- or brown-shelled eggs.

The face fly, *Musca autumnalis*, a pest which constantly attacks the eyes of animals as they graze, is becoming a serious menace to livestock in this country.

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